

Exam Total/50:	Quiz Ave:	Name:
Exam Percent:	Course Ave:	

Spring 2016 Math 245 Mini Midterm 2

Please read and follow these directions:

Please write legibly, with plenty of white space. Please print your name in the designated box, similarly to your quizzes. Please fit your answers in the designated areas. To get credit, you must also show adequate work to justify your answers. If unsure, show the work. All problems are worth 5-10 points. The use of notes, calculators, or other materials on this exam is strictly prohibited. This exam will last 30 minutes; pace yourself accordingly. Please remain seated until the end, to ensure a quiet test environment for others. Good luck!

Problem 1. Consider $f : \mathbb{R} \rightarrow \mathbb{R}$ given by $f(x) = x[x]$. Prove or disprove that f is injective.

Problem 2. Let A, B, C be sets, with $B \subseteq C$. Prove that $(A \times B) \subseteq (A \times C)$.

Problem 3. Carefully define each of the following terms:

- a. relation

- b. symmetric (relation)

- c. equivalence relation

- d. partial order

- e. surjective

Problem 4. Consider the relation R on \mathbb{Z} given by $aRb \Leftrightarrow |a - b| \leq 1$. Prove or disprove that R is transitive.

Problem 5. Find the general solution to the recurrence relation $a_n = -a_{n-1} + 6a_{n-2}$.